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Forthcoming Papers

O. Kutz, C. Lutz, F. Wolter and M. Zakharyaschev, $\mathcal{E}$-connections of abstract description systems

Combining knowledge representation and reasoning formalisms is an important and challenging task. It is important because non-trivial AI applications often comprise different aspects of the world, thus requiring suitable combinations of available formalisms modeling each of these aspects. It is challenging because the computational behavior of the resulting hybrids is often much worse than the behavior of their components.

In this paper, we propose a new combination method which is computationally robust in the sense that the combination of decidable formalisms is again decidable, and which, nonetheless, allows non-trivial interactions between the combined components.

The new method, called $\mathcal{E}$-connection, is defined in terms of abstract description systems (ADSs), a common generalization of description logics, many logics of time and space, as well as modal and epistemic logics. The basic idea of $\mathcal{E}$-connections is that the interpretation domains of n combined systems are disjoint, and that these domains are connected by means of n-ary 'link relations'. We define several natural variants of $\mathcal{E}$-connections and study in-depth the transfer of decidability from the component systems to their $\mathcal{E}$-connections. © 2004 Published by Elsevier B.V.

P.A. Bonatti, Reasoning with infinite stable models

This paper illustrates extensively the theoretical properties, the implementation issues, and the programming style underlying *finitary programs*. They are a class of normal logic programs whose consequences under the stable model semantics can be effectively computed, despite the fact that finitary programs admit function symbols (hence infinite domains) and recursion. From a theoretical point of view, finitary programs are interesting because they enjoy properties that are extremely unusual for a nonmonotonic formalism, such as compactness. From the application point of view, the theory of finitary programs shows how the existing technology for answer set programming can be extended from problem solving below the second level of the polynomial hierarchy to all semidecidable problems. Moreover, finitary programs allow a more natural encoding of recursive data structures and may increase the performance of credulous reasoners. © 2004 Published by Elsevier B.V.

P. Wang, The limitation of Bayesianism (Research Note)

H. Hirsh, N. Mishra and L. Pitt, Version spaces and the consistency problem

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doi:10.1016/S0004-3702(04)00036-0

J.D. Park and A. Darwiche, A differential semantics for jointree algorithms (Research Note)

J. Goldsmith, R.H. Sloan, B. Szörényi and G. Turán, Theory revision with queries: Horn, read-once, and parity formulas